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(REV. 1-98)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER

1503-0121P

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

09/743184

INTERNATIONAL APPLICATION NO.

PCT/FI99/00554

INTERNATIONAL FILING DATE

June 23, 1999

PRIORITY DATE CLAIMED

July 7, 1998

TITLE OF INVENTION

APPARATUS FOR HANDLING BUNDLES OF BOARDS A SUPPORT BED FOR USE IN SUCH AN APPARATUS

APPLICANT(S) FOR DO/EO/US

MANNIKKO, Ari

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
 2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
 3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39 (1).
 4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date
 5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau. WO 00/01609
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
 6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(3)).
 7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(2)).
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
 8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
 9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
 10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).
- Items 11. to 16. below concern document(s) or information included:
11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.-1449 and International Search Report
 12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
 13. ☒ A **FIRST** preliminary amendment.
☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
 14. ☐ A substitute specification.
 15. ☐ A change of power of attorney and/or address letter.
 16. ☒ Other items or information:
PCT/ISA/210
Four (4) sheets of formal drawings

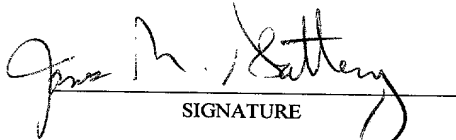
U.S. APPLICATION NO (if known, see 37 CFR 1.5)		INTERNATIONAL APPLICATION NO		ATTORNEY'S DOCKET NUMBER	
NEW 09/743184		PCT/FI99/00554		1503-0121P	
17. <input checked="" type="checkbox"/> The following fees are submitted:				CALCULATIONS PTO USE ONLY	
BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO.				\$1,000.00	
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO				\$860.00	
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO.				\$710.00	
International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4)				\$690.00	
International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4)				\$100.00	
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$ 1000.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$ 130.00	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total Claims	18 - 20 =	0	X \$18.00	\$ 0	
Independent Claims	1 - 3 =	0	X \$80.00	\$ 0	
MULTIPLE DEPENDENT CLAIM(S) (if applicable) none			+ \$270.00	\$ 0	
TOTAL OF ABOVE CALCULATIONS =				\$ 1130.00	
Reduction of 1/2 for filing by small entity, if applicable. Applicant claims Small Entity Status in accordance with 37 CFR 1.27.				\$ 0	
SUBTOTAL =				\$ 1130.00	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$ 0	
TOTAL NATIONAL FEE =				\$ 1130.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$ 0	
TOTAL FEES ENCLOSED =				\$ 1130.00	
				Amount to be: refunded \$	
				charged \$	

- a. ☒ A check in the amount of \$ 1130.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account. No. _____ in the amount of \$ _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
overpayment to Deposit Account No. 02-2448.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

Send all correspondence to:

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SIGNATURE

SLATTERY, JAMES M.
NAME

#28,380 (JMS)
REGISTRATION NO.

PATENT
1503-0121P

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant: MANNIKKO, Ari
Int'l. Appl. No.: PCT/FI99/00554
Appl. No.: NEW Group:
Filed: January 5, 2001 Examiner:
For: APPARATUS FOR HANDLING BUNDLES OF
BOARDS A SUPPORT BED FOR USE IN
SUCH AN APPARATUS

PRELIMINARY AMENDMENT

BOX PATENT APPLICATION

Assistant Commissioner for Patents
Washington, DC 20231

January 5, 2001

Sir:

The following Preliminary Amendments and Remarks are respectfully submitted in connection with the above-identified application.

AMENDMENTS

IN THE SPECIFICATION:

Please amend the specification as follows:

Before line 1, insert --This application is the national phase under 35 U.S.C. § 371 of PCT International Application No. PCT/FI99/00554 which has an International filing date of June 23, 1999, which designated the United States of America.--

IN THE CLAIMS:

Please amend the claims as follows:

Claim 3: line 1, delete "or 2"

Claim 4: line 1, change "any of claims 1-3" to --claim 1--

Claim 5: line 1, change "any of claims 1-4" to --claim 1--

Claim 6: line 1, change "any of claims 1-5" to --claim 1--

Please add the new following claims:

--9. An apparatus according to claim 2, characterized in that said load support members (31) and said mating members (53, 54) are provided with interlockingly mating shapes.

10. An apparatus according to claim 2, characterized in that said support member (31) is provided with a protruding part (32) forming an angle with the horizontal plane during the lifting operation.

11. An apparatus according to claim 3, characterized in that said support member (31) is provided with a protruding part (32) forming an angle with the horizontal plane during the lifting operation.

12. An apparatus according to claim 2, characterized in that each of said lift units (23,24) is actuated by two drive shafts driving lift means (25,26), such as lift chains, and that said drive shafts are arranged to be driven by a drive unit (27) equipped with a variable-frequency inverter and an angular pulse encoder or a similar position transducer.

13. An apparatus according to claim 3, characterized in that each of said lift units (23,24) is actuated by two drive shafts driving lift means (25,26), such as lift chains, and that said drive shafts are arranged to be driven by a drive unit (27)

equipped with a variable-frequency inverter and an angular pulse encoder or a similar position transducer.

14. An apparatus according to claim 4, characterized in that each of said lift units (23,24) is actuated by two drive shafts driving lift means (25,26), such as lift chains, and that said drive shafts are arranged to be driven by a drive unit (27) equipped with a variable-frequency inverter and an angular pulse encoder or a similar position transducer.

15. An apparatus according to claim 2, characterized in that when the number of said actuator means (27) is larger than one, the first one of said actuator means is a so-called master actuator and the others are so-called slave actuators.

16. An apparatus according to claim 3, characterized in that when the number of said actuator means (27) is larger than one, the first one of said actuator means is a so-called master actuator and the others are so-called slave actuators.

17. An apparatus according to claim 4, characterized in that when the number of said actuator means (27) is larger than one, the first one of said actuator means is a so-called master actuator and the others are so-called slave actuators.

18. An apparatus according to claim 5, characterized in that when the number of said actuator means (27) is larger than one, the first one of said actuator means is a so-called master actuator and the others are so-called slave actuators.

REMARKS

The specification has been amended to provide a cross-reference to the previously filed International Application. The claims have also been amended to delete multiple dependencies and to add claims 9-18. Entry of the present amendment and favorable action on the above-identified application are respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

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JMS/rem
1503-0121P

(Rev. 04/19/2000)

Apparatus for handling bundles of boards and a support bed
for use in such an apparatus.

The present invention relates to an apparatus according to the preamble of
claim 1 for handling strapped bundles of boards. The invention further
5 concerns a support bed according to claim 7.

Apparatuses of the type concerned in the invention are used, e.g., in the
storage systems of various board products. One such apparatus is described
in publication WO 96/20121. The apparatus includes a storage area in which
10 units of strapped board bundles are stored in stacks. The end-to-end stored
stacks of units form a storage row. The number of successive stacks in a
storage row as well as the number of parallel storage rows may be varied as
required. The units are stacked on a support bed, or a pallet. A stacker
carrier is arranged to move the stacked units and their support beds in the
15 storage area. The stacker carrier is of a so-called lukki-type straddle carrier
in which the unit to be lifted and transferred is held between the high-rise
legs of the straddle carrier chassis. The straddle carrier is adapted to move
along a track of rails. The straddle carrier includes a lift device suited for
moving the strapped units of boards with their support beds to the storage
20 stacks and away therefrom. The lift device of the straddle carrier includes
grip members, or grabbers, connected to each other at their upper ends by
transverse beams. Due to the structure of the lift device and other
accessories, this straddle carrier embodiment of a conventional construction
needs substantial extra space about its upper end. Moreover, the
25 construction of the lift device allows the straddle carrier when unloaded to be
elevated to its desired operating height only at its target location.

It is an object of the present invention to provide a stacker carrier with a
novel type of construction capable of overcoming the disadvantages of con-
30 ventional techniques.

The invention is principally characterized by lift units adapted to the opposite

sides of the stacker carrier, said lift units being individually movable and arranged to cooperate so as to elevate/lower the strapped units of boards resting on a support bed.

- 5 More specifically, the invention is characterized by what is stated in the appended claims.

The arrangement according to the invention has a number of significant benefits. The space required by the apparatus has been reduced substantially. The combination according to the invention of a support bed with cooperating grip members provides a construction which is superior to the prior art in simplicity and reliability. The stacker carrier according to the invention offers a more efficient utilization of a storage area. Moreover, the construction costs of the apparatus are reduced. The operating speed of the apparatus has been improved inasmuch the unloaded grip members can be moved in the vertical direction during the travel of the stacker carrier unhindered by the board stacks resting in the storage area. Resultingly, a storage capacity vastly greater than that available in the prior art is attained.

- 20 In the following, the invention will be examined in more detail with the help of an example by making reference to the attached drawings in which

Figure 1 shows an embodiment utilizing an apparatus according to the invention;

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Figure 2 shows an embodiment of the apparatus according to the invention in a side view;

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Figure 3 shows an apparatus according to the invention viewed from the direction of arrow A in Fig. 2;

Figure 4 shows an embodiment of the lift device used in the apparatus;

Figure 5 shows an embodiment of the support bed used in the apparatus;

Figure 6 shows a support bed used in the apparatus in an end view, and

Figure 7 shows detail A of Fig. 6.

In Fig. 1 is shown an embodiment suitable for utilizing an apparatus according to the invention. The embodiment comprises a storage area 1 in which strapped units 2 of are stored in stacks. The successive board stacks 3 form a storage row. The number of successive stacks of units in a row as well as the number of parallel storage rows may be varied as required. The strapped units 2 are stacked on a support bed 4 called a pallet later in the text. Transfer of the units 2 and the pallets 4 in the storage is arranged by means of a stacker carrier 5. The stacker carrier 5 is advantageously of the wheeled straddle carrier type also known as a lukki carrier, whereby the strapped unit to be lifted and transferred is moved elevated between the high-rise wheeled legs of the stacker carrier. The stacker carrier is arranged to move along a track 6 formed by, e.g., rails with the help of conventional drive means. The stacker carrier 5 is equipped with a lift device capable of moving the units with their pallets into the storage stacks 3 and off the storage stacks, respectively. Each storage row is situated between a pair of adjacent rails 6 forming a track, whereby the storage row is laid between the wheeled legs of the stacker carrier. The storage system further includes a unit handling arrangement 7. This unit handling arrangement is provided with transfer means for receiving a strapped unit 2 from, e.g., the board manufacturing lines and forwarding the same to further handling.

The invention disclosed in the present application is particularly related to a stacker carrier 5 and a pallet 4 cooperating with the same. The stacker carrier is illustrated in Figs. 2 and 3. The diagrams also show two units stacked on each other. The stacker carrier comprises a chassis having

essentially upright columnar legs 11, 12, 13, 14 connected respectively to each other at their lower ends by bracing beams 15, 16 running parallel to the travel direction of the carrier, and further at their upper ends, by bracing beams 17, 18 running parallel to the travel direction of the carrier as well as by transverse bracing beams 19, 20 oriented crosswise to the travel direction of the carrier. The stacker carrier is equipped with transfer means such as wheels 21, 22 that are driven by conventional drive means (not shown). The stacker carrier further includes a lift device comprising a first lift unit 23 adapted to operate in conjunction with the pair of columnar legs 11, 12 of the stacker carrier that are located on a first side of the storage row and a second lift unit 24 adapted to operate in conjunction with the pair of columnar legs 13, 14 of the stacker carrier that are located on a second side of the storage row. In the embodiment shown in the diagrams, the lift units 23, 24 are arranged to move between their respective pair of columnar legs, possibly supported by said legs. Obviously, the stacker carrier has means for elevating and lowering said lift units. Said means for elevating/lowering each lift unit separately may be implemented, e.g., comprising at least one drive shaft and at least one lift means 25, 26 such as a lift chain, belt or cable that is connected by its first end, e.g., to said drive shaft and by its second end to the body of the lift unit or, alternatively, is passed to the drive shaft and/or the lift unit. In the embodiment illustrated in the diagram, the lift means comprise chains 25, 26 having their both ends connected to said lift unit 23, whereby the drive shaft located at the upper part of said lift unit is provided with a drive sprocket for either chain and the lower part of the lift unit is respectively provided with an idler sprocket over which the chain is passed. Each of the lift units are arranged to be actuated by both ends with the help of separate lift means. Typically, there is adapted one lift means per each end of the lift unit. The drive shafts are adapted driven by a drive unit 27, advantageously equipped with a reduction 28. The drive unit 27 may be an electric motor, for instance, such as a squirrel-cage motor. As the drive shafts are mounted in a conventional manner in bearings adapted to the body of the lift device, this system is prior art well known to a skilled person and thus needing no further

discussion herein.

The apparatus according to the invention is principally characterized by lift units 23, 24 adapted to the opposite sides of the stacker carrier, said lift units being individually movable and arranged to cooperate so as to elevate/lower the strapped units of boards resting on a support bed 4. The lift unit 23, 24 includes load support members 31 and, respectively, the support bed 4 includes mating members 53 for locking the support bed 4 to the lift units 23, 24 at least for the duration of a lifting operation. The load support members 31 and the mating members 53, 54 are provided with interlockingly mating shapes. For this purpose, the load support member 31 may be provided with, e.g., a bracket part 32 extending at a right angle in the horizontal plane during the lifting operation.

In the embodiment shown in the diagrams, each lift unit is actuated by two drive shafts on which are arranged lift chains 25, 26 serving to elevate and lower the lift unit 23, 24. The rotation of the drive shafts is arranged to take place by means of, e.g., a drive unit 27 equipped with a variable-frequency inverter and an angular pulse encoder or a similar position transducer. Thus, the drive shafts can be driven with an extremely high positional accuracy. When the number of the drive units is greater than one, the first one of the drive units can be a so-called master drive unit while the others are so-called slave drive units. Then, the slave units follow accurately the movements of the master unit based, e.g., on the control signals obtained from the angular pulse encoders, thus assuring that the horizontal positions of the lift units 23, 24 remain extremely well synchronized in the same plane. Additionally, this arrangement eliminates deviations in the positions of the lift units 23, 24 from a horizontal plane under an unbalanced load.

An embodiment of the lift unit 24 of the apparatus according to the invention is shown in Fig. 4. The lift unit comprises a body part 30 having a support member 31 rotatably adapted thereon with at least one support surface 32

resting on a backing surface of the support bed 4. To the opposite ends of the body part 31 are arranged roller members 33, 34, 35, 36 adapted to run on backing surfaces of the columnar legs 11, 12, 13, 14 of the stacker carrier. The stacker carrier further includes means 37, 38 for moving said support member at least between the transfer position and the home position of the support bed. Said means for moving said support member may comprise, e.g., a pneumatic actuator 37, 38 such as a pneumatic cylinder. The support member 31 is mounted at its upper part to the body part 30 of the lift unit pivotally rotatable about a shaft 39, 40. By virtue of the pneumatic cylinder units 37, 38, the support member 31 is made to perform a movement which brings the support surface 32 of the support member under the corresponding backing surface of the support bed 4. The lift unit is further provided with attachments 41, 42, 43, 44 for a hoisting element such as a hoisting chain. The embodiment of the lift unit shown in the diagrams is additionally equipped with a levelling system using actuator cylinder units 45, 46 at either end of the lift unit 23, 24, thus permitting the tilting of the lift units if so required.

According to a preferred embodiment, the support bed 4, or support pallet, is formed from two longitudinal support beams 50, 51 having a plurality of transverse braces 52 placed therebetween. The longitudinal support beams 50, 51 are shaped or complemented to include protruding brackets 53 to which the support surface 32 of the support member 31 of the lift unit of the stacker carrier 5 can be locked. The support bed has a ladder construction. The transverse braces 52 form a support structure under the strapped units of boards resting thereon. Advantageously, the support bed 4 is made slightly larger or equal to the maximum dimensions of the largest board in production. Then, a number of smaller units can be placed adjacent to each other on a single support bed. At least two opposite edges 53, 55 of the support bed, or pallet, are shaped into backing surfaces 54 capable of mating with the gripping support surfaces 32, or grip means, of the support members of the lift units 23, 24. In the embodiment shown in the diagrams,

the protruding bracket edge 53 of the support bed is slanted downward from the horizontal plane by an angle α . While the angle α may be varied in a wide range according to the needs of specific embodiment, in the embodiment illustrated in the diagrams the angle is from 5° to 30°, typically from 10° to 15°.

The stacker carrier 5 is typically provided with means (not shown in the diagrams) for locating the support bed. Said locating means include sensor devices such as photocells adapted to the support members, or grip means 23, 24 of the lift unit of the stacker carrier and cooperating elements such as reflective surfaces adapted on the support bed 4. The grip members 23, 24 grip the support bed 4 at least by two bracket edges 53, 54 shaped to the opposite sides of the bed. Additionally, the grip members are provided with conventional elements securing the hold of the grip members on the support bed. Such securing means include, among others, inductive limit position sensors and pressure gages required in the actuator system operating with a pressurized medium. In the arrangement according to the invention based the cooperation of a purpose-designed support bed with mating lift units, there is no need to maintain a continuous pressure of the support members of the lift units against the support bed during lifting and transfer operation, because the support members are arranged to lock on the support bed. Thereby, undesirable forces are prevented from being imposed on the external constructions such as the chassis of the stacker carrier.

To those versed in the art it is obvious that the invention is not limited by the exemplifying embodiments described above, but rather, can be varied within the scope and spirit of the appended claims.

Claims:

1. An apparatus for handling strapped units of boards, said apparatus comprising a stacker carrier (5) capable of moving the strapped units (2) placed on a support bed (4) in a storage area into storage stacks and off from said storage stacks, respectively, characterized by lift units (23, 24) adapted to the opposite sides of said stacker carrier (5), said lift units being individually movable and arranged to cooperate so as to elevate/lower the strapped units of boards resting on said support bed (4).
2. An apparatus according to claim 1, characterized in that the lift unit (23, 24) includes load support members (31) and, respectively, the support bed (4) includes mating members (53) for locking the support bed (4) to the lift units (23, 24) at least for the duration of a lifting operation.
3. An apparatus according to claim 1 or 2, characterized in that said load support members (31) and said mating members (53, 54) are provided with interlockingly mating shapes.
4. An apparatus according to any of claims 1 - 3, characterized in that said support member (31) is provided with a protruding part (32) forming an angle with the horizontal plane during the lifting operation.
5. An apparatus according to any of claims 1 - 4, characterized in that each of said lift units (23, 24) is actuated by two drive shafts driving lift means (25, 26), such as lift chains, and that said drive shafts are arranged to be driven by a drive unit (27) equipped with a variable-frequency inverter and an angular pulse encoder or a similar position transducer.

6. An apparatus according to any of claims 1 - 5, characterized in that when the number of said actuator means (27) is larger than one, the first one of said actuator means is a so-called master actuator and the others are so-called slave actuators.

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7. Support bed for use in an apparatus according to claim 1, characterized in that at least two opposite edges of the support bed (4) are provided with mating members (53, 55) capable of locking said support members (31) of said lift units to said support bed (4).

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8. Support bed according to claim 7, characterized in that said mating members of said support bed (4) are formed by bracket edges (53, 55) slanted downward by an angle (α) from the horizontal plane.



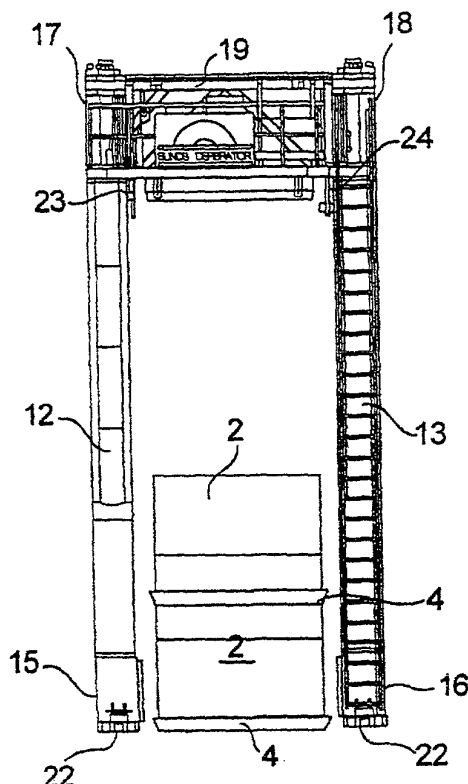
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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			(43) International Publication Date: 13 January 2000 (13.01.00)
(21) International Application Number: PCT/FI99/00554 (22) International Filing Date: 23 June 1999 (23.06.99) (30) Priority Data: 981566 7 July 1998 (07.07.98) FI (71) Applicant (for all designated States except US): SUNDS DEFIBRATOR PANELHANDLING OY [FI/FI]; PL 15, FIN-15561 Nastola (FI). (72) Inventor; and (75) Inventor/Applicant (for US only): MÄNNIKKÖ, Ari [FI/FI]; Keskustie 3 D 34, FIN-15550 Nastola (FI). (74) Agent: HEINÄNEN OY; Annankatu 31-33 C, FIN-00100 Helsinki (FI).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published With international search report. In English translation (filed in Finnish).	

(54) Title: APPARATUS FOR HANDLING BUNDLES OF BOARDS AND A SUPPORT BED FOR USE IN SUCH AN APPARATUS

(57) Abstract

The present invention relates to an apparatus for handling strapped units of boards, said apparatus comprising a stacker carrier (5) capable of moving the strapped units (2) placed on a support bed (4) in a storage area into storage stacks and off from said storage stacks, respectively. To the opposite sides of said stacker carrier (5) are adapted lift units (23, 24) adapted so as to be individually movable and arranged to cooperate so as to elevate/lower the strapped units of boards resting on said support bed (4). The invention also concerns a support bed suitable for use in the apparatus.



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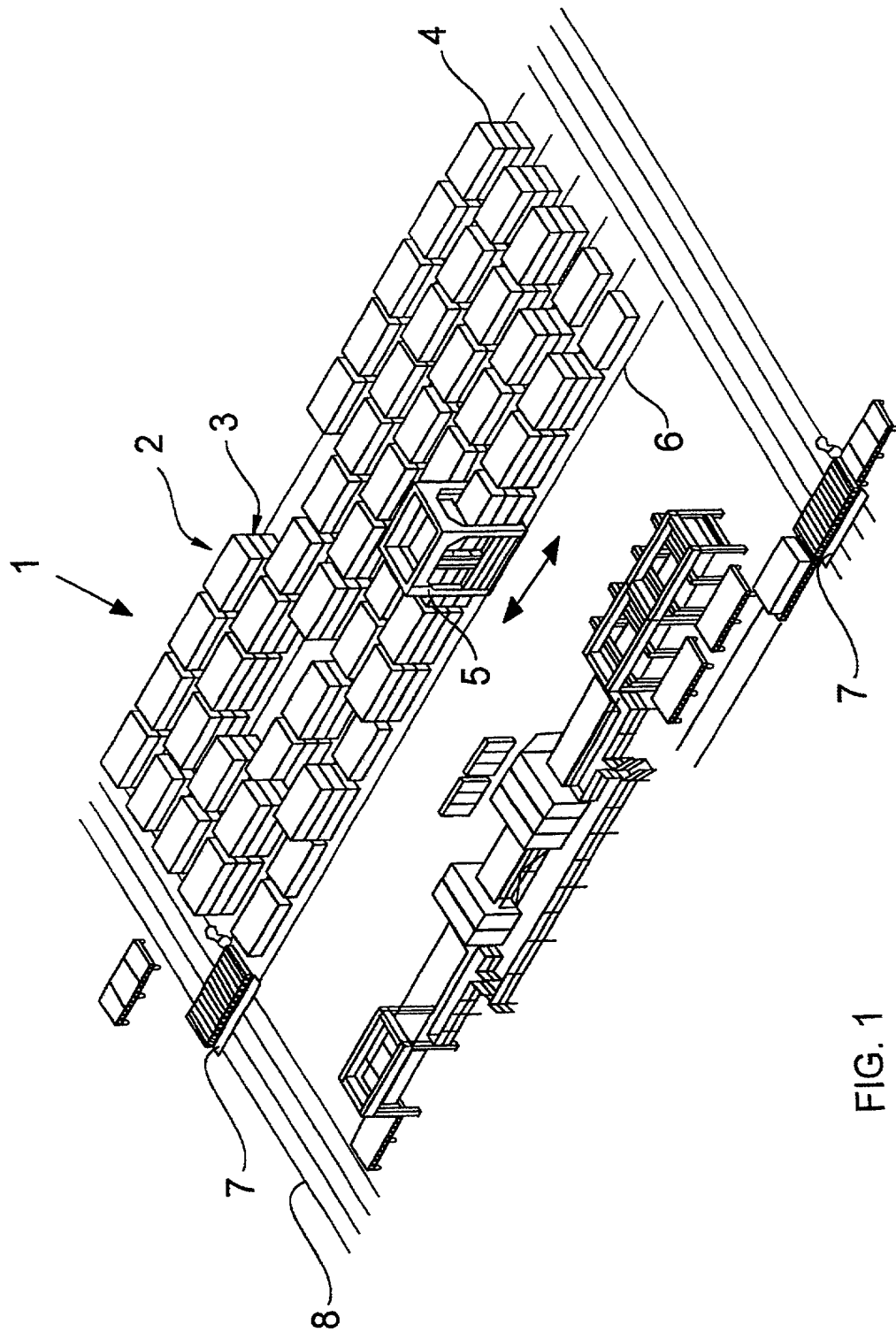
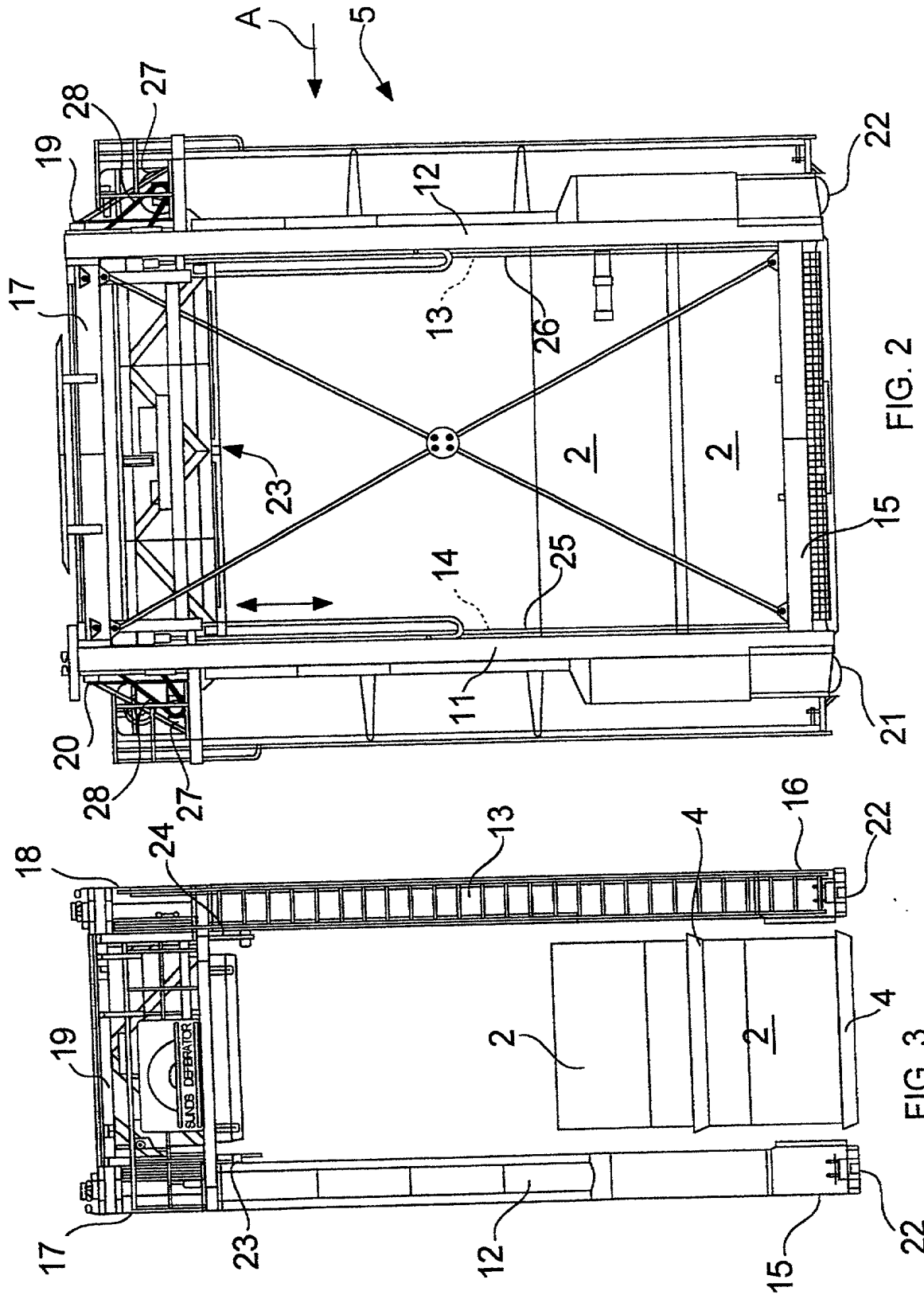


FIG. 1



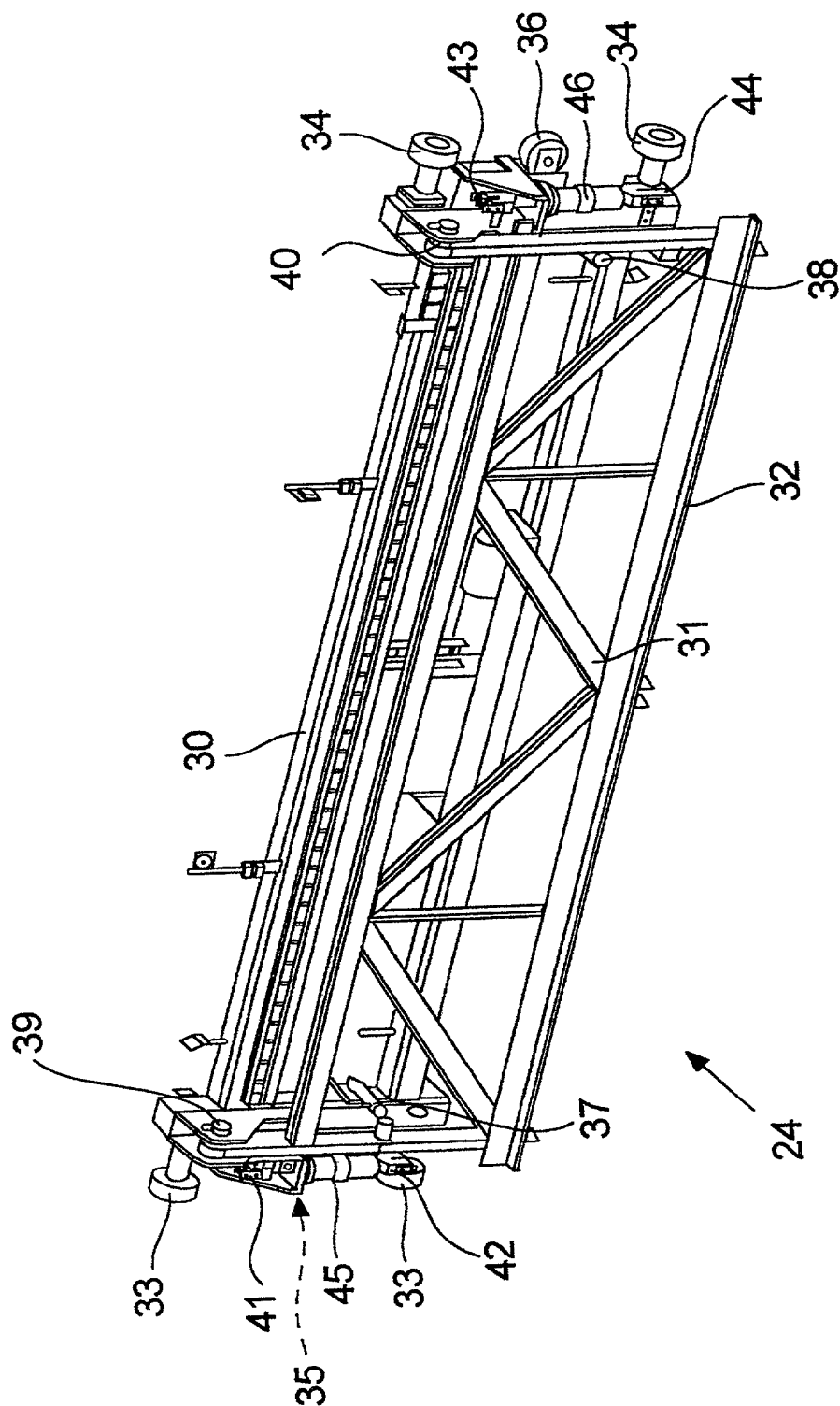
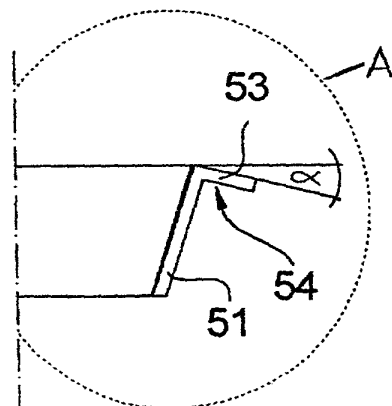
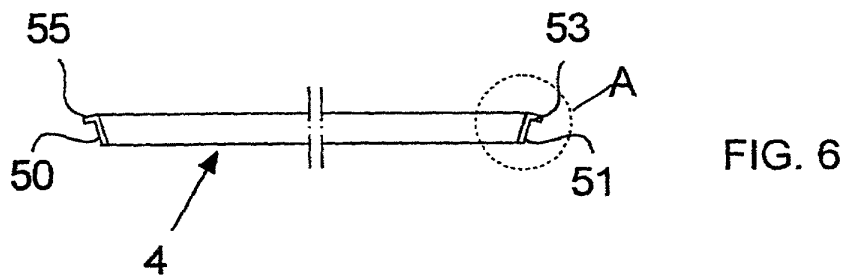
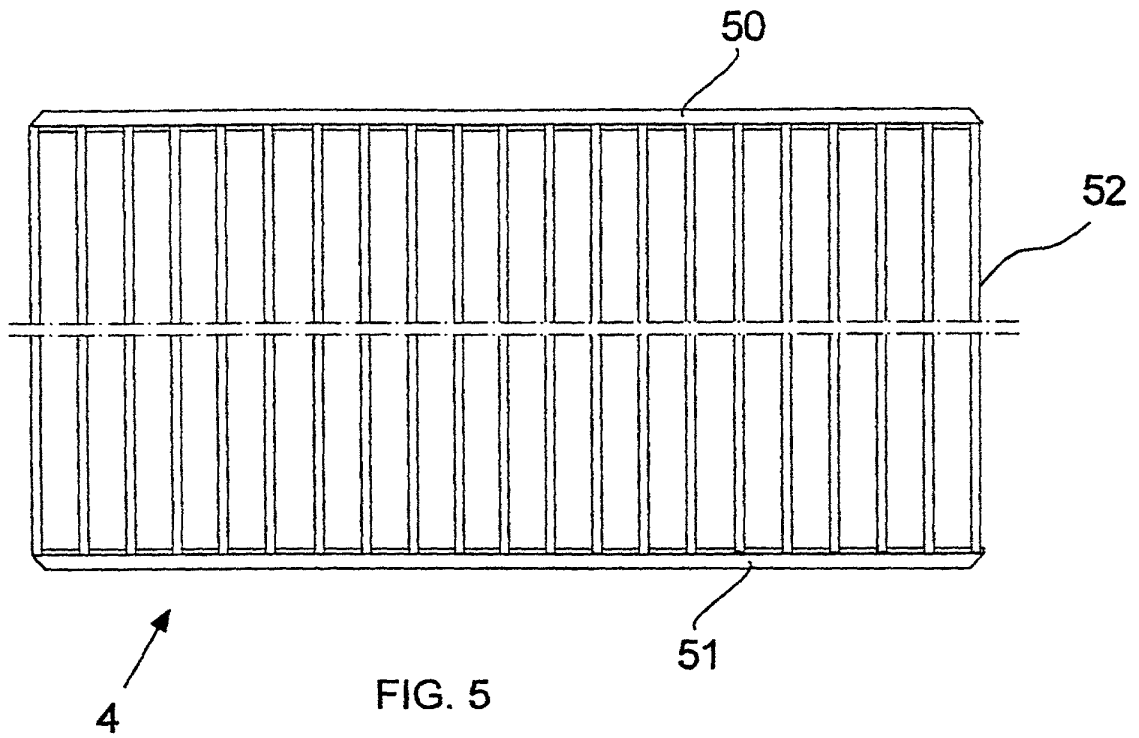


FIG. 4

4/4



PLEASE NOTE:
YOU MUST
COMPLETE THE
FOLLOWING:

COMBINED DECLARATION AND POWER OF ATTORNEY

FOR PATENT AND DESIGN APPLICATIONS

As a below named inventor, I hereby declare that: my residence, post office address and citizenship are as stated next to my name; that I verily believe that I am the original, first and sole inventor (if only one inventor is named below) or an original, first and joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: Apparatus for handling bundles of boards and a support bed for use in such an apparatus

Insert Title:

Fill in Appropriate
Information -
For Use Without
Specification
Attached:

the specification of which is attached hereto. If not attached hereto,

the specification was filed on _____ as
United States Application Number _____; and /or

the specification was filed on _____ as PCT
International Application Number _____; and was
amended under PCT Article 19 on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I do not know and do not believe the same was ever known or used in the United States of America before my or our invention thereof, or patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months (six months for designs) prior to this application, and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by me or my legal representatives or assigns, except as follows.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 (a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Insert Priority
Information:
(if appropriate)

Prior Foreign Application(s)			Priority Claimed	
981566	Finland	July 7, 1998	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
(Number)	(Country)	(Month/Day/Year Filed)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
(Number)	(Country)	(Month/Day/Year Filed)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
(Number)	(Country)	(Month/Day/Year Filed)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
(Number)	(Country)	(Month/Day/Year Filed)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
(Number)	(Country)	(Month/Day/Year Filed)	<input type="checkbox"/> Yes	<input type="checkbox"/> No

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below.

Insert Provisional
Application(s):
(if any)

(Application Number)	(Filing Date)
(Application Number)	(Filing Date)

All Foreign Applications, if any, for any Patent or Inventor's Certificate Filed More Than 12 Months (6 Months for Designs) Prior To The Filing Date of This Application:

Insert Requested
Information:
(if appropriate)

Country	Application No.	Date of Filing (Month/Day/Year)

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

Insert Prior U.S.
Application(s):
(if any)

(Application Number)	(Filing Date)	(Status - patented, pending, abandoned)
(Application Number)	(Filing Date)	(Status - patented, pending, abandoned)

I hereby appoint the following attorneys to prosecute this application and/or an international application based on this application and to transact all business in the Patent and Trademark Office connected therewith and in connection with the resulting patent based on instructions received from the entity who first sent the application papers to the attorneys identified below, unless the inventor(s) or assignee provides said attorneys with a written notice to the contrary:

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PLEASE NOTE:
YOU MUST
COMPLETE THE
FOLLOWING:

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Full Name of First or Sole
Inventor:
Insert Name of Inventor
Insert Date This
Document is Signed

Insert Residence
Insert Citizenship

Insert Post Office
Address

Full Name of Second
Inventor, if any:

see above

Full Name of Third
Inventor, if any


see above

Full Name of Fourth
Inventor, if any

see above

Full Name of Fifth
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GIVEN NAME <u>Ari</u>	FAMILY NAME <u>Männikkö</u>	INVENTOR'S SIGNATURE 	DATE* <u>2.2.2001</u>
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GIVEN NAME	FAMILY NAME	INVENTOR'S SIGNATURE	DATE*
Residence (City, State & Country)		CITIZENSHIP	
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Residence (City, State & Country)		CITIZENSHIP	
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* DATE OF SIGNATURE